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THE EFFECTS OF CONTINUOUS WAVE LASER RADIATION IN THE VISIBLE REGION AGAINST *E.COLI O157: H7* IN PROBIOTIC *DOOGH*

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ABSTRACT

This study is an attempt to explore the possibility of carrying live microorganisms and active probiotic *doogh* as a functional food with acceptable organoleptic properties as well as assessing the survival of pathogenic *E. coli* bacteria in probiotic products affected by the continuous wave laser (EW). In this study, probiotic microorganisms (*Lactobacillus casei*) was inoculated with the amount of 10^9-10^8 CFU/mL and pathogenic *E. coli* bacteria was inoculated with the amount of 10^3 CFU/mL into the *doogh*. The *doogh* samples were radiated by the continuous laser with the wavelength of 437 nm for 10, 20, 30, and 60 minutes. During the cold storage period (days 1, 3, 5 and 7), microbial evaluation (bacterial pathogen destruction, survival of probiotic bacteria) and changes in pH were investigated. Based on the findings of this study survival of the pathogenic bacteria was statistically significant during different days of storage time ($p<0.05$). The lowest count of all treatments was observed on the 7^{th} day of storage period. Laser treatment and probiotics had a synergistic effect on reducing the pathogenic bacteria ($p< 0.05$). However, the decrease in the survival of *E. coli* in the probiotic *doogh* and laser radiation treatment was much more than these treatments individually. According to the results of the probiotic bacterial count, the highest survival was observed after the 60-minute radiation at the end of the storage time. Laser treatment has no significant effect on the pH reduction in compared with the control sample.